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# Global Imbalances from the Historical Perspective

Marcela Veselkova \*

**Abstract:** »Globale Ungleichgewichte aus historischer Perspektive«. This paper examines the global imbalances in two eras of globalization. The main focus is on the medium-run factors that determine the current account balances. The results suggest that relatively rich countries with developed financial markets, high quality institutions and high proportion of dependent persons tend to run current account deficits (or lower surpluses) in both periods. On the other hand, the high initial level of net foreign assets increases the current account balance. This holds especially in the prewar period. The government budget balance has a positive effect on the current account balance in some instances. In the prewar period, the government budget balance plays the role only in the short-run, suggesting the importance of the short-run fluctuations in the current account balance. The twin deficits hypothesis plays a more important role in the second era of the globalization. However, it holds only for developing countries. These results suggest that the twin deficit hypothesis and the global savings glut hypothesis are not mutually exclusive.

**Keywords:** global imbalances, historical comparison, panel regressions.

## 1. Introduction

The past decade was marked by the puzzling development in the international economy. In 1999 the developing world as a whole stopped running current account deficits (Wolf 2009, 39). On the other hand, the United States, the world's largest economy and the major military power, started running the current account deficit of an unprecedented size. In 2006, the U.S. current account deficit reached its low of 6 percent of GDP or 803.5 billion USD in absolute terms (WEO 2009). Surprisingly, this deficit was financed mostly by the developing countries in East Asia and oil-exporters. The phenomenon was termed the global imbalances.

The current debate surrounding the global imbalances typically contrasts two views: the twin deficit hypothesis and the savings glut hypothesis. The former asserts that the large U.S. current account deficit is the result of the large budget deficit; the latter argues that the U.S. current account deficit is driven by the savings glut in the rest of the world. These excess savings are

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then channeled to the world's deepest and the most liquid financial markets, which happen to be in the United States.

The global imbalances took place also in the past globalization process. Between 1870 and 1913, a period known as the first era of globalization, Britain ran an average current account surplus of 4.5 percent of GDP. At the eve of the World War I, this surplus reached an astonishing value of 8.6 percent of GDP. France and Germany, the second and the third biggest creditors of the period, ran the surplus of 3.3 and 1.3 percent respectively during the 14 years running to the World War I. These large current account surpluses were matched by the persistent current account deficits of the countries in the New World but also in Northern or Eastern Europe. For example, Canada and Australia ran current account deficits of more than 7 percent of GDP between 1870 and 1913 (all data come from Taylor 2002).

Previous studies of the pre-World War I creditors and debtors focused mostly on the main determinants of the capital flows, such as the dependency ratio (Williamson and Taylor 1994), natural resources, migrants, and educated, young, urban populations (Clemens and Williamson 2004), the colonial status that significantly reduced the default risk perceived by investors (Ferguson and Schularick 2006), or institutional quality (Schularick and Steger 2008).

This paper takes a different approach and examines the main determinants of the current account directly, drawing on the previous empirical works (Chinn and Prasad 2003, Ito and Chinn 2007, Chinn and Ito 2007a, and Debelle and Faruquee 1996). The main aim of the paper is to test the twin deficits and the global savings glut hypothesis. The empirical analysis relies upon the dataset comprised of 14 countries for the period of 1865 through 1913 and 107 countries (21 developed and 86 developing) for the period of 1970 through 2007.

To anticipate the findings, I find the following. The results suggest that the twin deficits hypothesis and the global savings glut hypothesis are not mutually exclusive. The former holds better for developing countries. In the pre-War period, the government budget balance is significant only in the short-run, suggesting the importance of the short-run fluctuations in the current account balance (see Veselkova 2010). The global savings glut hypothesis holds for the post-Bretton-Woods period. Countries with more developed financial markets tend to run current account deficits (or lower current account surpluses). However, the significance of the capital openness was not confirmed. Similar conclusions hold for the pre-War period. There, however, the testing of the hypothesis is limited by the data availability. Finally, the higher the initial level of the net foreign assets, the higher the current account balance. This was true especially in the pre-World-War I period.

## 2. Historical Overview

In this section, I discuss the evolution of the global imbalances in two eras of globalization. The emphasis is on the effect of global imbalances on policies, as well as the surrounding academic debates. I define global imbalances as the situation when substantial and persistent current account surplus in one country (or a set of countries) is matched by substantial and persistent current account deficit in another country (or a set of countries). The current account balance is defined as the difference between savings and investment.

In the pre-1914 era, key creditor nations, principally Britain, France and Germany, developed enormous one-way positions in their portfolios. Britain, the largest capital exporter, invested abroad 5 percent of GDP between 1873 and 1913, reaching peak of 10 percent just before the outbreak of war (Fishlow 1985, 384). The capital exports of France averaged roughly half of British levels, both on average and for the final surge in 1910-13 (ibid). Germany, which was a latecomer, exported 2 percent of GDP (ibid). Overall, in 1914, these three countries accounted for almost three quarters of the world total foreign investment (Esteves 2008, 31, table 1). As indicated by the title of Feis's (1930) book, Europe was a true banker of the world.

The capital exports were directed to various world regions. Great Britain invested mostly in the New World and within the Empire. The largest capital importer was the United States. However, foreign lending accounted for no more than 10 to 15 percent of the U.S. investment during the peak years (Fishlow 1985, 384). In contrast, France and Germany exported the capital mostly to their colonies and Europe, with Russia being the largest debtor. The majority of these capital flows were directed to relatively rich countries (Clemens and Williamson 2004; Schularick and Steger 2008; Esteves 2008), giving empirical support to the classical paradox of capital's failure to flow from countries with relatively high capital/labor ratios to countries with relatively low ratios (Lucas 1990).

The high capital exports led to a policy response especially in Great Britain. The last third of the nineteenth century was marked by economic and political rivalries among the Great Britain, continental powers France and Germany and the United States. Facing relative decline in world markets and diplomacy, Britain's capital investments became highly politicized. Although the general course of the *laissez-faire* attitude to the foreign investment did not change, there were several episodes, which point out to the execution of the political influence over the course of the movement of the British capital.<sup>1</sup> The most apparent interventions in the capital movement were those of Joseph Chamberlain through his position of the Colonial Secretary. Within weeks of taking

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<sup>1</sup> For the discussion of the interaction between British overseas investment and the 'New Liberalism', see Offer (1983).

office in 1895 Chamberlain publicly pledged himself to a policy of development in the crown colonies, many of which he regarded “as being in the condition of underdeveloped estates” to be developed “by the judicious investment of British money” (Will, 1970, 131). The development support focused mostly on Africa and West Indies.<sup>2</sup> Government intervened only sporadically and mostly in instances where the foreign investment could be used as a tool of economic diplomacy (see Feis, 1974). That was the case of a sudden removal of the Governmental support from the Bagdad Railway scheme (Feis 1974, 342-360; and Francis 1973); intervention in the Chinese loan (Edwards 1928) or the bail out of the Baring Brothers (Ferns 1960, Ferns 1992, Mitchener and Weidenmier, 2007).

In addition to the above mentioned one-time interventions, a more systemic tool was used to affect the movement of British capital, namely the Colonial Stock Acts (especially 1900 revision). Their aim was to promote the economic development of the colonies and dominions by directing the capital towards the British dominions and colonies (Feis 1974, 92-95). However, it must be noted that although the volume of capital for Empire Colonial and Provincial obligations nearly doubled between 1900 and 1914, the proportion of British capital exports destined for the British Empire declined steadily after 1900 (Stone 1999, 12).

The large European current account surpluses were wiped out by the World War I. Europe was forced to liquidate major part of its huge assets abroad and borrow from abroad to finance its war efforts. On the other hand, the War mobilized the U.S. economy and largely accelerated its transition from a net debtor to an important creditor nation. During the interwar period, the capital flows were affected by the problem of reparations and war debts and disrupted by the financial crashes of the 1930s and the beginning of the Great Depression. After the World War II, the United States emerged as the major world creditor.

In the second era of globalization that started with the collapse of the Bretton Woods international monetary system in 1971, most of the capital flew among the rich countries. There were only two episodes of significant capital flows to developing countries: Latin America at the end of the 1980s and East Asia and Latin America in the 1990s. Both episodes were disrupted by the financial crisis. However, Lucas paradox became even more puzzling in the first decade of the third millennium: the capital started to flow from the labor-abundant China (and East Asia) to the capital rich United States. But whereas the current account surpluses accumulated by the developing countries and their capital flows to the centre of the international economy were new, the

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<sup>2</sup> For a closer account of Chamberlain’s involvement in Africa, see Dumett (1975) and in the West Indies, see Will (1970).

current account deficit of the world's largest economy has been a decades old story.

The United States, once the world's largest creditor, became a net debtor in 1982, when its current account balance slipped into deficit of 3.39% of GDP and has remained there ever since, with a single exception of 1991. Further breaking point came in 1986, when the U.S. net international investment position, a difference between U.S.-owned assets abroad and foreign-owned assets in the United States, turned negative and reached the value of -21.8 billion USD (U.S. Bureau of Economic Analysis). The United States was thus the net debtor in both the flow and stock terms.

The country that replaced the United States in its traditional role of the world's largest creditor was Japan, which rose to an economic power by the 1970s. The Japanese current account balance has been in surplus since 1981 and it continued to rise rapidly, reaching a peak of more than 4 percent of GDP in 1986, or 85.9 USD billion in absolute terms (International Financial Statistics, IMF). In the same year, Japan became the world's largest creditor. Japanese foreign assets totaled \$437.7 billion, while liabilities amounted to \$307.9 billion, leaving Japan with net assets of \$129.8 billion (New York Times, 28/May/1986).

How to deal with the imbalance was a matter of heated debate among scientists as well as in Washington. Some associated the deteriorating trade balance with the appreciating dollar. Krugman (1985) and Cooper (1985) argued that the foreign exchange market had been driven by an irrational "speculative bubble", which pushed dollar above "fundamental" levels, and this way induced the trade deficit. As a result of the fast dollar appreciation, the price competitiveness of U.S. products relative to the rest of the world decreased. The policy recommendation was to talk the dollar down or intervene in the foreign exchange market, possibly in combination with a fiscal contraction. This strategy was partly employed in 1985 Plaza Accord, by which governments of the major trading nations agreed to depreciate the U.S. dollar in relation to the Japanese yen and German Deutsche Mark by intervening in the currency markets. Despite the success of the interventions, the U.S. trade deficit did not significantly decrease.

The need for the fiscal contraction was emphasized by the European countries and Japan, which were concerned about the ballooning U.S. budget deficit, as the Reagan administration cut income tax, indexed tax brackets for inflation and increased the defense spending. The call for fiscal contraction found its support in the twin deficit argument, which points out to the correlation between the fiscal and the trade deficit (Sachs and Roubini 1987, Ueda 1988, Ito 2009). The two are linked through the changes in interest rates. The U.S. fiscal expansion and the Japanese fiscal contraction raised U.S. interest rates relative to Japanese rates, induced a capital inflow from Japan to the United States, caused the dollar appreciation and worsened the U.S. trade balance.

In contrast to the theories presented above stands the position that the U.S. trade deficit was a result of U.S. economic strength. “It is a mystery to me why,” writes Milton Friedman (1988),

it is regarded as a sign of Japanese strength and American weakness that the Japanese find it more attractive to invest in the U.S. than Japan. Surely it is precisely the reverse – a sign of U.S. strength and Japanese weakness.

According to this view, the international capital flew to the economy with the best investment opportunities. Therefore, the policy recommendation was to do nothing.

This *laissez-faire* attitude prevailed during the first Reagan administration, 1981-1984.<sup>3</sup> The main opposition to the non-interventionist attitude of the White House and the Treasury came from the Congress. The growth of the imports to the United States was matched by the growth of the protectionist rhetoric and led to the trade and investment frictions between the United States and Japan. The shift in the government policy came when the trade deficit was heading to a new record in 1985, nearly four times what it was in 1981. In order to reduce the deficit and deal with the protectionist pressure in the Congress, the administration moved towards activism on exchange rates and pressures on opening of foreign markets to U.S. exports.

Easing of the protectionist pressures came only with a temporary reduction in the U.S. current account deficit due to the brief 1990-1991 recession. In 1991, the current account balance achieved a single positive value since 1982. However, the modest surplus of 1991 was mostly caused by large unilateral transfers from the U.S. allies in the Gulf War. Since the mid-1990s, the U.S. current account deficit began to balloon again. What changed was the source of its financing.

The key counterparts of the U.S. current account deficit were current account surpluses accumulated by China, oil-exporters and emerging Asia. In East Asia, the current account surpluses were motivated by the traumatizing experience of the East Asian crisis and were meant to buffer the impacts of the future potential crises. Compared to South East Asia, China was unaffected by the crisis. The willingness of China to finance the U.S. current account deficit stems from its commitment to the export-led growth and the solution to the trilemma subordinated to this development model. China opted for the stability of the fixed exchange rates and capital controls to prevent capital flows from undermining the peg. The independent monetary policy was sacrificed. Such a solution to the trilemma resembles the post-World War II monetary system and was therefore dubbed as “Bretton Woods II” by some (see Dooley *et al.* 2003). Finally, the source of the recent current account surpluses of the oil-exporting

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<sup>3</sup> For an overview of the trade policy, see Destler (2005). For an overview of the American economic policy, refer to Feldstein (1995).

countries lied elsewhere. Following the high increase in the price of oil, these countries started to accumulate petrodollars in exchange for their oil exports.

Similarly to the Japanese-American trade debate, the protectionist opposition came from Congress.<sup>4</sup> China was accused of manipulating its currency to maintain the price competitiveness of its exports. Between September 2003 and 2008, some three dozen new congressional bills with various sponsors were floated to challenge alleged Chinese unfair commercial practices, and bills introduced since January 2005 focused increasingly on the currency value (Hufbauer and Brunel 2008). A similar rhetoric was partially adopted by the White House. Treasury Secretaries John Snow and Henry Paulson tried to persuade China that exchange rate flexibility is in its own interest, as well as in the interest of the global economy and the United States.

However, Chinese authorities have had a different stance on the issue. They have rejected the accusation that Chinese exchange-rate policy has given China an unfair advantage, as well as the idea that an appreciation of renminbi would resolve the global imbalances. They point out to the problems of the U.S. economy – low savings rate, and suggest cuts in both the consumer and government spending. Thus, similarly to Japan in the 1980s, China argues in line with the twin deficits argument.

In contrast stands the global savings glut hypothesis (Bernanke 2005, Caballero *et al.* 2006, Ferguson 2009), according to which the excess of savings in developing countries combined with their underdeveloped financial markets directs these excess savings to the United States, whose deep and liquid financial markets are able to absorb it. Thus, similarly to the United States in the 1980s, the policy recommendation is to do nothing on the U.S. part. Instead, China and other developing countries are advised to liberalize their capital account and adopt policies that would enhance the development of their financial markets.

Although the presence of the global imbalances in both eras of globalization allows to draw interesting conclusions from the comparison, one should be cautious about the differences between two periods. First and foremost, whereas the world's largest economy and the major military power was the world's largest creditor in the prewar period, it has been the world's largest debtor in the second era of globalization. Thus, whereas in the prewar period the excess savings were accumulated in the world's richest countries, mostly as a side-effect of the industrial revolution, and redistributed to the developing part of the world, the situation has been more complex in the second era of globalization. There the current account surpluses were occasionally run by oil-exporting countries, part of the rich European countries and in the past decade by China and East Asian countries. The savings of these countries were driven

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<sup>4</sup> For the review of the Sino-American trade relations and the Congressional bills aimed at the renminbi revaluation, refer to Hufbauer and Brunel (2008) and Hufbauer *et al.* (2006).



by different factors. Whereas German economy is heavily export-oriented and oil-exporters benefit from the influx of petrodollars, Chinese household savings has risen due to the Open Door economic reforms and the growth prospects they generated, as well as the introduction of the one-child policy at around the same time, which led to a gradual increase in the ratio of employed to total population (Modigliani and Cao 2004, Kraay, 2000). A complementary explanation is related to the precautionary motives (Chamon and Prasad 2008, Bernanke 2006). The lack of social safety nets in China and the rising private burden of expenditures on housing, education, and health care lead to precautionary savings, even in the poor rural areas. For example, only about 14 percent of the population is covered by health insurance, and pension plans (which, in any case, replace only about 20 percent of pre-retirement earnings) apply to only about 16 percent of the economically active population (Bernanke, 2006). In contrast to the prewar period, this savings was redistributed to the core country of the international economy. In 2005, United States absorbed at least 80% of the savings that the rest of the world did not invest at home (Roubini and Setser 2005, 2).

Second, there are significant structural differences between two eras of globalization. Although both periods witnessed increasing capital mobility and financial integration (Obstfeld and Taylor 2004), the solution to the trilemma in the two periods was different. The classical gold standard of the prewar period rested on the fixed exchange rates and free capital mobility at the cost of independent monetary policy. Following the collapse of the Bretton Woods international monetary system, most of the developed countries gradually moved towards flexible exchange rates, whereas a significant part of the developed world continued to peg their currencies. Finally, the prewar period was characterized by significant flows of migrants from the Old World to vast empty territories of the New World. These are absent in the current era and impossible to replicate.

Given these differences, we may ask whether forces determining the savings and investment balances, and thus the current account balances, were the same in two eras of globalization. In the next sections, I first discuss this question from the theoretical perspective and then examine it using panel data analysis.

### 3. Theoretical Issues

There are two major competing explanations of the global imbalances: the twin deficits hypothesis and the global savings glut hypothesis. The former draws the link between the current account balance and the budget balance, the latter between the current account on the one hand and the financial development and the capital openness on the other.

## Financial Development

The effect of the financial deepening on the current account balance is ambiguous. Edwards (1995) suggests that the financial deepening could induce more saving. On the other hand, he notes that if the financial deepening is understood as a relaxed borrowing constraint, it may have the opposite effect and lead to the reduction in savings. The latter is emphasized by the proponents of the global savings glut hypothesis.

The global savings glut hypothesis predicts the negative relationship between the financial development and savings: less financially developed markets offer little investment opportunities and therefore lead to higher savings rate. The accumulated savings are then transferred to the countries with more developed financial markets (Bernanke 2005). The ability of countries to generate financial assets from real investments was emphasized by Caballero *et al.* (2006). Their formal model illustrates that in the world comprised of (1) countries with deep financial markets and good growth conditions, (2) countries with deep financial markets but temporarily bad growth conditions and (3) countries with underdeveloped financial markets but exceptional growth conditions, the capital will flow to the first and generate the current account deficit.

The imperfect substitutability of financial instruments was stressed for both periods of globalization. Temin (1987, 453; 1989) argues that in the pre-War period the British investors faced a choice between liquid foreign bonds and illiquid equities of domestic firms. Similarly, Blanchard *et al.* (2005) argue that there is imperfect substitutability not only between U.S. and foreign goods but also between U.S. and foreign assets. The U.S. current account deficit is thus a result from exogenous increase in U.S. demand for foreign goods and in foreign demand for U.S. assets.<sup>5</sup>

The financial development proxies were based on M1 or M2 monetary aggregates. For the period of 1865-1913, M2 as a share of GDP (M2GDP) is used as the proxy of the financial development. Although this proxy gives the picture of the monetization of the economy, it does not capture more specific aspects of the financial development, such as the stock and bond market development. These played an important role in Great Britain: in 1850 an estimated 56 percent of financial assets could be classified as domestic or foreign debt, whereas in 1913 this had reached 64 percent of the total (Michie 1999, 71).

De Gregorio and Guidotti (1995) argue that M1 and M2 may be a poor proxy of financial development because they do not capture the ability of financial intermediaries to channel funds from savers to borrowers. Rather, M1 and M2 are more related to the ability of financial systems to provide transaction services. Therefore, in line with King and Levine (1993), I proxy the fi-

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<sup>5</sup> Unfortunately, the imperfect substitutability of financial instruments is difficult to test for a broad sample using the pre-war data.

financial development as M3 as % of GDP (the liquid liabilities) for the period of 1970-2007. This measure includes currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents.<sup>6</sup>

The second proxy of the financial development is the ratio of domestic credit (CREDIT) to the private sector to GDP (see De Gregorio and Guidotti 1995, King and Levine 1993, Ito and Chinn 2007). The major advantage over the monetization ratio is that it excludes credit to the public sector and therefore captures the role of financial intermediaries in channeling funds to the private sector. Thus, an increase in the credit to the private sector may be understood as a relaxed borrowing constraint.

The problem of this proxy is that it captures only the financial development that occurs through the banking system and does not capture the financial development that occurs in the non-bank system, e.g. in stock markets. Therefore, the third proxy of the financial development is the stock market capitalization as a percentage of GDP (STOCK). To capture the effect of the overall size of the financial market, I use SIZE, the sum of private credit creation and stock market capitalization, both measured as a ratio to GDP (Chinn and Ito, 2007, 7).

As the size of the financial market may be less relevant if there is little market activity (Beck et al. 2001), I control also for the activeness of the market. Following Ito and Chinn (2007), I use the stock market total value (SMTV) traded as a ratio to GDP and stock market turnover (SMTO) as a ratio to GDP as proxies of the financial market activity. Second, to capture the efficiency of the financial market, I rely on two banking sector indicators: the net interest margin (MARGIN) and bank's overhead costs as a share of their total assets (OVERHEAD). Finally, I control also for the effect of the public bond market capitalization (PBBM). M3/GDP data comes from WDI. The rest of the data for the period of 1970 through 2007 comes from the December 2009 update of Beck *et al.* (2000) database. The historical data for the pre-War period come from Butlin (1961), Bordo et al. (2001), Capie and Webber (2005), de Mattia (1967), Gregory (2004), Grytten (2004), Klovland (2004), Mitchell (2008), Tilly (1973), U.S. Bureau of the Census (1975), and Urquhart (1963).

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<sup>6</sup> It must be noted that if measured as the monetization, the U.S. financial development is above average but not exceptional: the average U.S. M3GDP between 1970 and 2007 is 0.71. This value is close to the mean plus 1 s.d. value of 0.84. Similarly, British monetization ratio is relatively smaller compared, e.g. to Scandinavian or German, probably reflecting the dominance of the stock market over the banking financial development.

## Capital Openness

In the global imbalances debate, Bernanke (2005) suggests that the openness of the financial markets can affect the direction of cross-border capital flows. For example, the capital account liberalization in East Asian economies allowed the excessive savings flow to the United States and other countries with developed financial markets. It is of interest to examine also the interaction between the financial development and the capital openness. The proxy of the capital openness is KAOPEN index (Chinn-Ito 2007b).

The variable is not included in the analysis of the pre-war current account. The main reason is the data availability.<sup>7</sup> However, I do not expect that exclusion of this variable would have a significant effect on the results because the classical gold standard era was associated with free capital mobility. Even in countries, where governments tried to control the way their citizens or banks invested their capital, the latter had the choice of channeling their funds through other financial centers, especially London (Esteves 2008, 1).

## Budget Balance

In contrast to the global savings glut stands the twin deficits argument that points out to the positive correlation of the current account and the budget balance. The intertemporal models of the current account suggest that the government budget deficits induce current account deficits by redistributing income from future to present generations (Obstfeld and Rogoff 1998). In case of absent Ricardian equivalence (Barro 1974), i.e. the budget deficit coupled by an increase in the private savings as the taxpayers save for the future tax rise; the budget deficit might result in the decrease in national savings (or a Keynesian increase in aggregate demand).<sup>8</sup> The expected sign of the government budget estimate is therefore positive. The fiscal balance is measured as government budget balance as a share of GDP.

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<sup>7</sup> A possible solution would be to replace KAOPEN index by the net foreign capital flows as a share of GDP. However, there is a theoretical difficulty in equaling capital inflows with capital openness. An economy with a high degree of capital openness may still attract only small capital inflows, if other factors, such as institutional quality or educated labor force are missing. Second, the most widely used data on British capital exports gathered by Stone (1999) would pose two problems. First, based on the studies by Clemens and Williamson (2004), Esteves (2008) or Schularick and Steger (2008), it is reasonable to expect a high correlation between the capital inflows and the GDP per capita. This would plague the regression with multicollinearity. Second, these data do not cover French and German capital flows, which played an important role in Europe. For example, Russia, the largest European debtor, enjoyed large capital inflows from France thanks to the Franco-Russian Alliance. Thus, Stone's data would underestimate the capital inflows to European regions.

<sup>8</sup> For the review of the literature on the Ricardian effects, see Bernheim (1987) and Briotti (2005).

For the period of 1970-2007, the budget balance (GOVBAL) was measured as the cash surplus/deficit as a percentage of GDP. The data come from World Development Indicators database. For the pre-War period, the budget balance was measured as the difference between the government revenue and the government expenditure as a percentage of GDP. The data come from Mitchell (2008), Bordo *et al.* (2001), and Obstfeld and Jones (1997).

In addition to the twin deficits and the global savings glut hypotheses, there is a large body of literature that points out to other determinants of the current account balance over the medium-run.

### Dependency Ratio

Widely discussed are demographic factors, especially the one child policy of China. According to the life cycle theory, a higher share of economically dependent persons in the population reduces national savings, and hence the current account balance (see Mason 1988). However, the demographic profiles matter only in case when they differ across countries. Williamson and Taylor (1994) argue that in the pre-War period high dependency rates in three New World countries (Argentina, Australia and Canada) depressed domestic savings rates and pulled in foreign investment. Therefore, it is appropriate to view the large capital inflows as an intergenerational transfer from old savers in the Old World to young savers in the New World. Typically, a one-percentage-point rise in the dependency rate led approximately to a one-percentage-point fall in the aggregate savings rate. However, this did not hold for the fourth country in their sample, the United States. The reason could be that Great Britain and the United States had roughly similar youth dependency ratios from 1880 to 1910. Green and Urquhart (1976, 228, fn) note that the emigration of those in the 20-40 age group increased the youth dependency in the UK, whereas the immigration of the same age group to the United States decreased the youth dependency despite higher U.S. natural increase rates.

The story of dependency ratios of the past decade is well-known. Chinese policy of one child decreased the dependency rates. Furthermore, preference of sons over daughters leads to a distortion in the natural male-female rates in the population. In China alone, the imbalance between the sexes was 108 boys to 100 girls for the generation born in the late 1980s and escalated to 124 to 100 for the generation of the early 2000s (Economist, 4 March 2010). Distorted sex ratios can be found also in other East Asian countries or western Balkans and the Caucasus. Wei and Shang (2009) suggest that this imbalance further raises savings in China via the bequest motives, as families with sons save to make their son competitive in the marriage market.

Modigliani (1970) also suggests that in a life-cycle setting, higher income growth will lead to higher private savings as a result of aggregation across households. However, Carroll and Summers (1991) argue that the relationship

between the economic growth and savings is ambiguous and should be negative in the short run. To capture the differences in the demographic profiles of countries, I use total (DEPR), old (OLDEP) and youth dependency ratio (YTHDEP) as a percentage of GDP, where the age dependency ratio is defined as the share of young and old age population (below 15 and above 65) to working age population (between 15 and 64). The data come from WDI database. For the pre-war period, I use the youth dependency ratio measured as the proportion of the children aged 14 or below as a fraction of the total population. The data comes from Clemens and Williamson (2004).

### Economic Growth

Economic growth is another factor often cited as the current account determinant. The stage of economic development hypothesis suggests that a country moving from a low to an intermediate stage of development requires higher investment (see Kindleberger 1993 or Lassudrie-Duchêne *et al.* 1990). Therefore, it imports capital and runs the current account deficit. As the country matures, its current account balance improves and it is able to repay its external liabilities. Lassudrie-Duchêne *et al.* (1990) point out that as the competition from the developing countries rises, the profitability of mature economies falls. They lower their savings and increase their consumption, which results in the trade balance deficit.

Two proxies are used to capture the stage of economic development hypothesis. First, the real per capita income (relative to the average real per capita income of Great Britain, France and Germany in the pre-War period (RELY-INCOME) or relative to the average real per capita income of the high-income OECD countries in the post-BW period (RELYOECD)) is expected to have a positive relationship with the current account, as the countries at the lower stage of economic development are assumed to run current account deficits. However, if taking into account Lassudrie-Duchêne *et al.* (1990), the expectations about the sign are ambiguous. Second, real economic growth (ECON-GROWTH) is expected to have the negative relationship with the current account, as the less developed countries tend to grow faster than the developed countries and are borrowing against their future income. For the period of 1970-2007, the data come from the WDI database. For the pre-War period, the data come from Clemens and Williamson (2004).

### Net Foreign Assets

As the current account is the sum of the trade balance and the return on a country's stock of net foreign assets (NFA), the stock of NFA serves as an initial condition. There are two hypothetical relationships between the NFA and the CA. Countries with a higher initial NFA can sustain a higher trade deficit while remaining solvent. Here, the relationship between the NFA and the CA is nega-

tive. The positive relationship exists for countries with higher NFA that enjoy higher foreign income flows. This was the case of the prewar Great Britain. Its net income from shipping, insurance, interest and dividends were more than sufficient to produce a substantial current account surplus, despite running a deficit on merchandise trade (Eichengreen 2005, 14). The NFA is measured as net foreign assets in the initial year of the five-year average. The data come from an updated version of Lane and Milesi-Ferretti (2007). For the pre-War period, the data come from Goldsmith (1985). Here, the sample is drawn down to six countries due to data availability.

### Institutional Quality

Institutional quality affects the incentives to save and invest, as it defines how well the returns from these activities are protected. For example, the high risk of expropriation has a negative impact on the incentive to invest.<sup>9</sup> Decisions by foreign residents are affected too. Alfaro et al. (2005) document that the institutional quality is the major factor that attracted the capital flows during 1970-2000. Similar conclusion was made by Schularick and Steger (2008) for the prewar period.

Chinn and Ito (2005) find that in the developed countries, the effect of the financial development on savings is conditional on the legal system and open financial markets: countries with highly developed legal system and open financial countries undertake less savings. For less developed countries and emerging market countries they find the reverse correlation: greater financial development leads to higher savings.

Three proxies are used to capture institutional quality. The primary proxy is POLITY2 score of the POLITY IV Project.<sup>10</sup> The score reflects various aspects of the institutional quality, such as existing constraints on the exercise of power by the executive, competitiveness and openness of executive recruitment and competitiveness and regulation of political participation. The range is (-10, 10). The higher the score, the higher the institutional quality. The second proxy is XCONST score of the POLITY IV Project, i.e. the existing constraints on the executive. The score is included in the POLITY2 variable but it is of interest to test for its effect separately, as it can be understood as a proxy of the risk of expropriation. Finally, bond spread (SPREAD) is assumed to capture the creditworthiness of the country in the prewar period.

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<sup>9</sup> Goetzmann and Ukhov (2006) document that British investors had access to information about political and economic situation.

<sup>10</sup> For a more detailed information, see Marshall and Jaggers (2009).

### Trade Openness

The importance of trade openness was emphasized by some of the U.S. politicians since the 1980s, who suggested the link between low trade barriers and the U.S. current account deficit. Trade openness could be correlated with the factors that make the country attractive to foreign investment. It may also signal a better ability to service external debt. This was particularly important in the prewar period. I measure the trade openness as the sum of imports and exports to GDP (TRADEGDP).

### Terms of Trade Volatility

Higher terms of trade of volatility might induce precautionary savings as consumers try to smooth their consumption in the face of more volatile income flows. I measure the terms of trade volatility as the standard deviation of the terms of trade over the corresponding five-year period (TOTSD). For the pre-War period, the data come from Williamson (2008). For the period of 1970-2008, the data come from WDI database.

### Oil

Finally, Sachs (1981) suggests that if the oil shock is expected to have a transitory effect on income, it will lead to the reduction in the current account balance. From this perspective, being an oil exporter may lead to an increase in the current account balance in episodes of oil price shocks. In order to control for the effect of oil, I include the OIL dummy, which takes the value of 1 for oil-exporting countries and 0 otherwise.

## 4. The Medium-Term Determinants of the Current Account Balance, 1865-1913

This part examines the medium-term determinants of the current account balance in the pre-World War I period. The data set is comprised of yearly data for 14 countries and covers the period of 1865-1913. The countries included in the sample are: Argentina (ARG), Australia (AUS), Canada (CAN), Denmark (DEN), France (FRA), Germany (GER), Italy (ITA), Japan (JPN), Norway (NOR), Russia (RUS), Spain (SPA), Sweden (SWE), United Kingdom (UK), and the United States (USA). The number of countries in the sample was constrained by the data availability. Nevertheless, in 1913 the countries included in



the sample produced almost 62 percent of the world GDP (Maddison, 2001).<sup>11</sup> The complete list of variables and the data sources is available upon request.

To capture the medium-term effects, 5-year non-overlapping averages are used.<sup>12</sup> For the last period 1910-1913, a 4-year average is used. In order to check the robustness of the results and to capture the long-term and short-term determinants of the current account, cross-section averages, as well as yearly data are used (see section on the robustness of the results).

The current account deficit ranged from -30 percent of GDP to 8.6 percent of GDP. The highest current account deficit was reached by Argentina in the years running up to the Baring Crisis of 1890. In 1989, the Argentinean current account deficit reached the value of more than 30 percent of GDP. The maximum current account surplus of 8.6 percent of GDP was reached by Great Britain in 1913.

Most of the correlations of explanatory variables are below 0.50. The correlation of POLITY2 and relative income per capita is slightly over 50%. This is in line with the seminal work of Acemoglu *et al.* (2001) who document the positive relationship between the economic growth and the quality of institutions. A more troublesome is the correlation between M2GDP and TRADEGDP, which is more than 70 percent. Furthermore, regressions with interaction terms are often plagued with multicollinearity problem. Therefore, I calculate the variance inflation factor (VIF) for multicollinearity. As a rule of thumb, VIF higher than 10 indicates serious multicollinearity problem. The largest VIF (POLITY2) is 10.899 and the mean VIF is 3.493. To check the robustness of the results, I reestimated the current account regressions without interaction terms. This decreased the largest VIF to 2.446 (TRADEGDP) and the mean VIF equaled 1.701. There was no significant change in the magnitude or the size of the coefficients in FE or PCSE model (see below). However, the effect of institutional quality in the FE model was no longer significant (the p-value was 14.6%, available upon request).<sup>13</sup>

#### 4.1 General Model

The aim of the empirical analysis is to identify the main determinants of current account deficit during the period of 1865-1913. The empirical approach follows the previous empirical studies of Debelle and Faruquee (1996), Calderon

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<sup>11</sup> Note that the proportion may be overestimated, as the data for Russia include all the countries of the former Soviet Union.

<sup>12</sup> It is important to note that the 5-year averages panel consists of 14 countries and 10 time periods. The panels with  $n > T$  are called short panels. Such panels pose different requirements on certain aspects of the estimation. These issues are discussed in more detail below.

<sup>13</sup> Traditionally, the mean-centering is used to solve the multicollinearity problem. However, the recent research suggests that mean-centering does not alleviate collinearity problems (see Echambadi and Hess 2007).

et al. (2002), Chinn and Prasad (2003), Ito and Chinn (2007), Chinn and Ito (2007a) and Lee (2008). To test the various explanations of the current account behavior, I estimate the model proposed by Ito and Chinn (2007, 10), which may be expressed in the following form:

$$y_{i,t} = \alpha_i + \beta_1 FD_{i,t} + \beta_2 IQ_{i,t} + \beta_3 KAOPEN_{i,t} + \beta_3 (FD_{i,t} * IQ_{i,t}) + \beta_4 (FD_{i,t} * KAOPEN_{i,t}) + \beta_5 (IQ_{i,t} * KAOPEN_{i,t}) + \lambda X_{i,t} + v_{i,t}$$

where the dependent variable is the current account balance expressed as a percentage of GDP (negative values indicate a deficit) for the  $i$ -th unit at time  $t$ . As the current account equals the difference between the saving and investment, the model is estimated also with savings and investment (as a percentage of GDP) as the dependent variables. The independent variables include the financial development (FD), institutional quality (IQ) and the capital openness (KAOPEN).  $X_{i,t}$  is the vector of control variables (real economic growth, real per capita income relative to the real per capita income of the average income of the UK, France and Germany, government budget balance, youth dependency ratio, trade openness, the terms of trade volatility and the initial net foreign assets). The vector  $\beta$  and  $\lambda$  is a vector of coefficients and  $v_{i,t}$  is the composite error.

To estimate the model, several techniques are considered. First, pooled ordinary least squares (OLS), fixed effects and random effects are estimated.<sup>14</sup> Each of the specifications is based on certain assumptions. The most common assumption made is the one of parameter homogeneity, i.e. we assume that  $\alpha_i = \alpha$  and  $\beta_{it} = \beta$  for all  $i, t$ . In other words, we assume that there is neither significant country nor significant temporal effect. However, it is more reasonable to assume that heterogeneity is the main characteristic of the countries under consideration. To model heterogeneity, one assumes that the composite error  $v_{i,t}$  – in case of the twoway model – consists of three components: (1) the country-specific and time-invariant error term  $u_i$ , sometimes referred to as the unobserved effect, (2) the specific time effect and (3) an idiosyncratic error  $\epsilon_{it}$  that captures the residual errors.

There are two assumptions made about the individual and/or time effects and the independent variables. The random effects assumption is that the unobserved effect is not correlated with the independent variables. The fixed effects assumption is that the unobserved effect is correlated with the independent variables. If the random effects assumption holds, the random effects model is preferred to the fixed effects model because the random effects estimator is more efficient than the fixed effects estimator. However, if there is correlation between the individual and/or time effects and the independent variables, then

<sup>14</sup> For an overview of the econometric analysis of the panel data, see Wooldridge (2002), chapters 13-14.

the individual and time effects must be estimated as dummy variables in order to solve the endogeneity problem. Therefore, the fixed effects model is sometimes called the least squares dummy variable model.

To put these considerations into practice, at first the simple pooled OLS model is estimated. This model serves as the benchmark model. Then the Breusch-Pagan Lagrange multiplier tests of country or/time effects based on the results of the pooling model are implemented (Breusch and Pagan 1980). The test results suggest significant country and/or time effects (not reported here).

Therefore, the panel techniques are preferred to the simple pooled OLS model, i.e. the fixed effects and random effects models are estimated. Next, Hausman test is used to test whether the random effects assumption of no correlation between the individual and/or time effects and the independent variables holds (not reported here). The results of the test indicate that the random effects assumption does not hold and so the fixed effects model provides a better specification. Finally, the F test is used to test whether the country, temporal or twoway effects are redundant (not reported here). The results suggest the use of fixed effects model with country effects.

Based on the above, the model of interest is the fixed effects model with country effects. Here, a note must be made about the autocorrelation in the model. The Durbin-Watson statistic formed by computing the first-order residual correlation on the stacked set of residuals suggests the presence of autocorrelation in the model. The presence of autocorrelation was further tested (not reported here). The results suggest the presence of serial correlation in idiosyncratic errors. This is supported especially by Wooldridge's test for the serial correlation in errors (see Wooldridge 2002, 10.6.3). An advantage of this test is that it does not rely on large  $T$  asymptotics and has good properties in "short" panels. It is also robust to general heteroskedasticity.

I deal with the autocorrelation problem in two ways. First, I adopt Arellano (1987) approach of computing White coefficient covariance estimates that are robust to heteroskedasticity and serial correlation and rely on large  $n$  asymptotics with small  $T$ , as is the case of the panel data used in this study.

Second, I adopt panel-corrected standard error estimator (PCSE) developed by Beck and Katz (1995), who suggest weighting the observations for AR(1) serial correlations and then adjusting the standard errors for cross-sectional correlation. The standard errors computed this way are robust to more general serial correlation. In regard to this study, the main advantage of the PCSE estimator is that it estimates the Parks model even when  $n > T$ .

Estimation results are reported in Tables 1, 2 and 3. The models of interest are FE model and PCSE model. As the current account is the difference between savings and investment, I re-estimate the basic model also with savings and investment as dependent variables. The relative income and growth rate are significant in both models. Contrary to the predictions of the stage of economic

development hypothesis, the coefficient of the relative income is negative. A 1 percentage point increase in relative income leads to a 0.115 to 0.128 percentage point decrease in the current account balance.

Similarly, the sign of the GDP growth indicates that faster growing countries tended to run current account surpluses. This is against the theoretical expectations that domestic economic growth accelerates demand for foreign goods and services and the current account balance deteriorates (see Abel and Bernanke 2001). A 1 percentage point increase in economic growth leads to a 0.413 to 0.559 percentage point increase in the current account balance.

Table 1: Current Account Regressions, 1865-1913

| Model              | FE country               | PCSE<br>FE country        | FE country                | PCSE                     |
|--------------------|--------------------------|---------------------------|---------------------------|--------------------------|
| C                  | 23.135<br>(7.724, 0.004) | 14.362<br>(13.231, 0.283) | -9.046<br>(11.780, 0.449) | 9.444<br>(11.419, 0.415) |
| RELYINCOME         | -0.115<br>(0.054, 0.036) | -0.128<br>(0.056, 0.025)  | -0.083<br>(0.104, 0.430)  | 0.010<br>(0.033, 0.761)  |
| ECONGROWTH         | 0.559<br>(0.149, 0.000)  | 0.413<br>(0.161, 0.013)   | 0.041<br>(0.188, 0.828)   | 0.267<br>(0.294, 0.372)  |
| YTHDEP             | -0.434<br>(0.150, 0.005) | -0.103<br>(0.332, 0.759)  | 0.140<br>(0.207, 0.504)   | -0.182<br>(0.333, 0.589) |
| GOVBAL             | 0.073<br>(0.207, 0.725)  | 0.098<br>(0.152, 0.523)   | -0.007<br>(0.161, 0.964)  | -0.110<br>(0.148, 0.465) |
| TRADEGDP           | -0.071<br>(0.113, 0.529) | 0.100<br>(0.114, 0.386)   | 0.337<br>(0.139, 0.022)   | 0.974<br>(0.076, 0.211)  |
| M2GDP              | 0.033<br>(0.033, 0.323)  | -0.101<br>(0.052, 0.056)  | 0.034<br>(0.029, 0.250)   | -0.144<br>(0.062, 0.029) |
| POLITY2            | -0.384<br>(0.216, 0.079) | -0.385<br>(0.346, 0.271)  | -0.596<br>(0.146, 0.000)  | -0.229<br>(0.432, 0.600) |
| M2GDP*POLITY2      | 0.003<br>(0.004, 0.458)  | 0.007<br>(0.005, 0.215)   | 0.006<br>(0.004, 0.201)   | 0.003<br>(0.006, 0.613)  |
| TOTSD              | -0.035<br>(0.044, 0.432) | -0.016<br>(0.044, 0.720)  | 0.027<br>(0.022, 0.240)   | 0.004<br>(0.059, 0.944)  |
| NFAin              |                          |                           | 0.088<br>(0.019, 0.000)   | 0.021<br>(0.017, 0.230)  |
| AR(1)              |                          | 0.505<br>(0.175, 0.006)   |                           | 0.490<br>(0.186, 0.014)  |
| Adjusted R-squared | 0.743                    | 0.772                     | 0.657                     | 0.621                    |
| Countries          | 14                       | 14                        | 6                         | 6                        |
| Observations       | 92                       | 78                        | 45                        | 39                       |
| Time span          | 1865-1913                | 1870-1913                 | 1865-1913                 | 1870-1913                |

Notes: White period standard errors and p-values in parentheses.

Sample 14: Argentina (ARG), Australia (AUS), Canada (CAN), Denmark (DEN), France (FRA), Germany (GER), Italy (ITA), Japan (JPN), Norway (NOR), Russia (RUS), Spain (SPA), Sweden (SWE), United Kingdom (UK), United States (USA).

Sample 6: Denmark, France, Italy, Japan, United Kingdom, United States.

Table 2: Savings Regressions, 1865-1913

| Model              | FE twoways                | PCSE<br>FE country        | FE twoways                 | PCSE FE country            |
|--------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| C                  | -4.126<br>(11.625, 0.724) | -1.666<br>(14.177, 0.907) | -62.174<br>(10.629, 0.000) | -34.465<br>(21.211, 0.118) |
| RELYINCOME         | 0.084<br>(0.059, 0.160)   | 0.176<br>(0.039, 0.000)   | 0.160<br>(0.119, 0.193)    | 0.048<br>(0.065, 0.471)    |
| ECONGROWTH         | 0.526<br>(0.235, 0.029)   | 0.425<br>(0.193, 0.032)   | -0.318<br>(0.433, 0.471)   | -0.005<br>(0.389, 0.990)   |
| YTHDEP             | 0.171<br>(0.364, 0.641)   | -0.049<br>(0.338, 0.886)  | 0.724<br>(0.733, 0.335)    | 0.489<br>(0.545, 0.379)    |
| GOVBAL             | -0.045<br>(0.234, 0.849)  | 0.270<br>(0.375, 0.474)   | 0.384<br>(0.436, 0.389)    | -0.053<br>(0.414, 0.899)   |
| TRADEGDP           | 0.276<br>(0.190, 0.152)   | 0.364<br>(0.125, 0.005)   | 1.164<br>(0.342, 0.003)    | 0.724<br>(0.182, 0.001)    |
| M2GDP              | -0.060<br>(0.057, 0.298)  | -0.132<br>(0.062, 0.038)  | 0.0365<br>(0.103, 0.727)   | 0.053<br>(0.057, 0.365)    |
| POLITY2            | 0.131<br>(0.622, 0.834)   | -0.340<br>(0.331, 0.309)  | 0.267<br>(1.066, 0.805)    | 1.198<br>(0.873, 0.184)    |
| M2GDP*POLITY2      | -0.008<br>(0.009, 0.358)  | 0.005<br>(0.005, 0.350)   | -0.005<br>(0.012, 0.672)   | -0.010<br>(0.014, 0.509)   |
| TOTSD              | 0.006<br>(0.075, 0.937)   | -0.005<br>(0.071, 0.941)  | 0.079<br>(0.054, 0.161)    | 0.044<br>(0.088, 0.626)    |
| NFAin              |                           |                           | 0.184<br>(0.617, 0.008)    | 0.125<br>(0.053, 0.027)    |
| AR(1)              |                           | 0.625<br>(0.144, 0.000)   |                            | -0.174<br>(0.284, 0.546)   |
| Adjusted R-squared | 0.760                     | 0.798                     | 0.705                      | 0.649                      |
| Countries          | 14                        | 14                        | 6                          | 6                          |
| Observations       | 92                        | 78                        | 45                         | 39                         |
| Time span          | 1865-1913                 | 1870-1913                 | 1865-1913                  | 1870-1913                  |

Notes: see Table 1.

Inspecting the results from the saving and investment regressions yields additional insights. The effect of the relative income and economic growth on the current account is less puzzling when looking at the savings and investment regressions. A 1 percentage-point increase in the economic growth leads to a -0.156 to 0.026 percentage point change in the investment but an effect of a higher economic growth on savings is much higher. A 1 percentage point increase in economic growth leads to a 0.425 to 0.526 increase in savings.

The effect of the youth dependency on the current account is in line with the theoretical predictions. A 1 percentage point increase in the youth dependency leads to a 0.434 percentage point decrease in the current account. Interestingly, the effect of youth dependency on savings is not significant.

Table 3: Investment Regressions, 1865-1913

| Model              | FE country                 | PCSE FE country            | FE country                 | PCSE                       |
|--------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| C                  | -22.942<br>(18.787, 0.226) | -22.352<br>(14.820, 0.137) | -30.536<br>(15.389, 0.057) | -17.640<br>(21.538, 0.422) |
| RELYINCOME         | 0.237<br>(0.099, 0.019)    | 0.290<br>(0.067, 0.000)    | 0.116<br>(0.101, 0.266)    | 0.119<br>(0.097, 0.232)    |
| ECONGROWTH         | -0.156<br>(0.157, 0.325)   | 0.026<br>(0.223, 0.909)    | 0.074<br>(0.158, 0.646)    | -0.188<br>(0.400, 0.643)   |
| YTHDEP             | 0.247<br>(0.330, 0.457)    | 0.143<br>(0.331, 0.667)    | 0.550<br>(0.376, 0.154)    | 0.190<br>(0.599, 0.754)    |
| GOVBAL             | 0.144<br>(0.141, 0.313)    | 0.103<br>(0.276, 0.710)    | 0.033<br>(0.191, 0.864)    | 0.013<br>(0.295, 0.966)    |
| TRADEGDP           | 0.371<br>(0.150, 0.016)    | 0.353<br>(0.136, 0.012)    | 0.455<br>(0.233, 0.060)    | 0.323<br>(0.173, 0.074)    |
| M2GDP              | -0.004<br>(0.037, 0.921)   | -0.009<br>(0.054, 0.867)   | 0.013<br>(0.066, 0.839)    | 0.022<br>(0.055, 0.698)    |
| POLITY2            | 0.802<br>(0.461, 0.086)    | 0.307<br>(0.399, 0.445)    | 0.771<br>(0.494, 0.129)    | 2.297<br>(0.853, 0.013)    |
| M2GDP*POLITY2      | -0.013<br>(0.007, 0.068)   | -0.006<br>(0.006, 0.341)   | -0.005<br>(0.008, 0.524)   | -0.022<br>(0.013, 0.120)   |
| TOTSD              | 0.026<br>(0.043, 0.545)    | 0.017<br>(0.069, 0.805)    | 0.050<br>(0.051, 0.330)    | -0.030<br>(0.079, 0.712)   |
| NFAin              |                            |                            | 0.046<br>(0.043, 0.286)    | 0.023<br>(0.040, 0.568)    |
| AR(1)              |                            | 0.408<br>(0.184, 0.030)    |                            | -0.076<br>(0.234, 0.749)   |
| Adjusted R-squared | 0.767                      | 0.803                      | 0.725                      | 0.0772                     |
| Countries          | 14                         | 14                         | 6                          | 6                          |
| Observations       | 93                         | 79                         | 45                         | 39                         |
| Time span          | 1865-1913                  | 1870-1913                  | 1865-1913                  | 1870-1913                  |

Notes: see Table 1.

The effect of the government balance is positive, albeit insignificant. However, when regressing the yearly data, it is highly significant (see robustness tests below). This suggests the importance of temporary shocks in determining the current account balance, as suggested by Veselkova (2010).

The institutional quality has a negative effect on the current account. According to the FE model, a 1 point increase in POLITY2 leads to a 0.384 percentage-point decrease in the CA balance. When looking at the savings and investment channels, higher institutional quality has a positive effect on both the savings and investment but this effect is stronger and significant in case of investment, where a 1 point increase in institutional quality leads to a 0.802 percentage point increase in investment. Furthermore, in case of investment regression, the effect of POLITY2 is mitigated by the interaction with the level of financial development. To estimate the partial effect of POLITY2 on IN-

VESTMENT conditional on M2GDP (and vice versa), it is of interest to plug in some meaningful values of POLITY2 (or M2GDP), such as mean, low and high 10 percentile and see whether this effect is significant.

For low levels of financial development, improvement in institutional quality leads to higher investment rates, whereas the opposite is true for high values of financial development. Note that the effect is significant only at minimum, maximum and low 10 percentile.

Table 4: Effect of POLITY2 on INVESTMENT Conditional on M2GDP

|                                  | Minimum                 | Low 10 percentile       | Mean                     | High 10 percentile       | maximum                  |
|----------------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| Value of M2GDP<br>(12.96, 87.25) | 12.96                   | 19.42                   | 40.25                    | 71.28                    | 87.25                    |
| Effect of POLITY2<br>(-10, 10)   | 0.636<br>(0.372, 0.092) | 0.553<br>(0.329, 0.097) | -0.286<br>(0.190, 0.137) | -0.113<br>(0.077, 0.149) | -0.318<br>(0.162, 0.054) |

Table 5: Effect of M2GDP on INVESTMENT conditional on POLITY2

|                                   | Minimum                 | Low 10 percentile       | Mean                     | High 10 percentile       | maximum                  |
|-----------------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| Value of POLITY2<br>(-10, 10)     | -10                     | -4.86                   | 1.52                     | 9.46                     | 10                       |
| Effect of M2GDP<br>(12.96, 87.25) | 0.125<br>(0.061, 0.043) | 0.059<br>(0.036, 0.107) | -0.023<br>(0.043, 0.592) | -0.125<br>(0.089, 0.166) | -0.132<br>(0.093, 0.159) |

According to the PCSE model, the effect of POLITY2 on the current account balance is of the same magnitude, albeit insignificant. Furthermore, PCSE model predicts that a 1 percentage point increase in M2GDP leads to a 0.101 reduction in the current account balance.

The implied current accounts (not reported here) suggest that the FE model performs better in capturing the current account behavior between 1865 and 1913. Based on this, the main effect of the financial development on the current account comes through the investment channel.

The results, thus, give some support to the global savings glut hypothesis that the excess savings, in this case accumulated by Great Britain, France or Germany, were distributed to countries with high degree of financial and institutional development. A note must be made about the proxy of the financial development. Measured as M2GDP, the financial development of Great Britain reached only average level, in contrast to Germany or Scandinavian countries that had the highest M2GDP. This probably reflects the dominance of stock market based financial system in the Great Britain and bank based financial system in Germany. Therefore, M2GDP does not seem to capture the high level of the British stock and bond market development. It is therefore possible to

speculate, whether the effect of the financial development would be different if measured as stock and bond market development. Unfortunately, such data are not available for a broad sample of countries. Second, it must be noted that (unlike the U.S. nowadays), the British level of institutional quality did not reach the high 10 percentile value.

As the role of income from foreign investment played a significant role in the prewar Britain, the last two columns of tables 1, 2 and 3 report estimation results controlling for the initial value of the net foreign assets.<sup>15</sup> Due to the data unavailability, the sample includes only the following countries: Denmark, France, Italy, Japan, the United Kingdom, and the United States. The results suggest that the net foreign assets were an important determinant of the current account balance: a 1 percentage point increase in the NFA increased the current account balance by 0.088 percentage points. This effect came through the savings channel, where a 1 percentage point increase in net foreign assets increased the savings by 0.184 percentage points. The effect of both the institutional quality and the financial development remains negative. This suggests that countries with higher levels of institutional quality and financial deepening tend to run current account deficits (or lower surpluses). Finally, trade openness has a significant positive effect on the current account: the higher the participation in the international trade, the higher the current account balance. Other variables are insignificant or marginally significant. For example, the effect of the institutional quality on investment has the p-value of 12.9%. The difference may be due to the smaller sample size or a stronger effect of the net foreign assets on the current account balance than the effect of other variables.

## 4.2 Robustness Tests

In order to examine the robustness of the results at higher frequencies, I reestimated the equation (1) using annual data (not reported here). As the models suffered from autocorrelation, I computed White period standard errors robust against serial autocorrelation. Based on the criteria listed above, the models of interest are FE and PCSE. Furthermore, to control for factors influencing the current account in the long-run, I estimated also the between model.

In general, the results support the regression using 5-year averages. The relationship between the youth dependency and the current account is negative: a 1 percentage-point increase in youth dependency decreases the current account balance by 0.362 percentage points (FE model). Higher institutional quality also decreases the current account balance: a 1 point increase in institutional quality leads to a 0.328 percentage point decrease in the current account balance (PCSE model).

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<sup>15</sup> Note that the AR term was insignificant in both the savings and investment regressions. Thus, the interpretation of results relies only on the fixed effects model.



Interestingly, the financial development has a significant negative effect on both the savings and the investment. A 1 percentage point increase in M2GDP decreases the savings by 0.054 to 0.078 percentage point and investment by 0.051 percentage point. However, in the long-run, the relationship between M2GDP and savings is positive: a 1 percentage point increase in M2GDP leads to a 0.374 increase in savings.

The major difference between the regressions using the yearly data and 5-year averages is in the significance of the government budget balance. Whereas it is insignificant in the medium-term, it is significant in the short-term: a 1 percentage point increase in the government budget balance leads to a 0.182 percentage point increase in the current account balance.

The effect of an increase in the government budget balance on savings is of a similar magnitude: a 1-percentage point increase in the government budget balance increases savings by 0.149 percentage points. This suggests that the government budget balance has a non-Ricardian effect on the savings rate, where the Ricardian offset in savings is 0.85 percentage point.

Neither relative income, nor growth rate coefficients were significant in case of the current account regression. However, the savings and investment regressions bring more insights into the effect of the economic development. Higher relative income leads to higher current account balance: a 1 percentage point increase in relative income increases savings by 0.105 to 0.111 percentage point. The effect on investment is stronger: a 1 percentage point increase in relative income leads to a 0.143 to 0.207 percentage point increase in investment. As a result, the effect of the relative income on the current account is negative, albeit insignificant. In the long-run, relative income is the single most important factor that determines both the current account balance and investment. Here, however, the sign of the coefficient is in line with the theoretical predictions: a 1-percentage point increase in economic growth leads to a 4.592 percentage point decrease in the current account balance and 5.374 increase in investment.

Finally, the trade openness has a positive effect on both savings and investment: A 1 percentage point increase leads to a 0.265 percentage point increase in savings and a 0.301 percentage point increase in investment. This suggests that an increasing participation in international trade leads to (1) an increase in savings due to revenue generated by trade, and (2) an increase in investment in the profitable export-oriented businesses.

To test the robustness of the results, I used two further proxies of institutional quality. First, I used constraint on the executive as a proxy of the risk of expropriation (not reported here). Surprisingly, its effect was insignificant. Second, I used SPREAD variable (Ferguson and Schularick 2006), which measures the difference between the yield on a country's bond and the yield on British consols. Clemens and Williamson (2004) used SPREAD as a proxy of investment risk not explained by economic fundamentals. There are small

discrepancies compared to the base regression. The effect of the financial development is negative at all levels of SPREAD. However, the effect of institutional quality measured as SPREAD is different from the base results. An increase in institutional quality, i.e. a decrease in spread, decreases the CA balance in countries with low levels of financial deepening. On the contrary, it increases the CA balance in financially developed countries (here, however, the effect is insignificant). The difference in the effect of SPREAD may come from two sources. First, the sample is smaller and does not include developed European countries, such as Great Britain, France or Germany.<sup>16</sup> Second, although the differences in spreads signal the creditworthiness of the country, it is debatable whether they are solely the result of differences in underlying institutional quality or whether these differences capture also the differences in the macro-economic fundamentals.<sup>17</sup>

## 5. Medium-Term Determinants of the Current Account Balance, 1970-2007

This section deals with the medium-term determinants of the CA balance during the period of 1970-2007. To capture the medium-term effects, 5-year non-overlapping averages are used. For the last period of 2005-2007, a 3-year average is used. To check the robustness of the results and to capture the long-term and short-term determinants of the current account, yearly data and cross-section averages are used (see section on the robustness of the results). The dataset covers 107 countries (21 developed, 86 developing). The complete list of variables and sources is available upon request.

Between 1970 and 2007, the current account balance as a percentage of GDP ranged from the minimum of -240 to the maximum of 99, with the mean CA balance equal to -2.571. To capture the sensitivity of results to outliers, I perform robustness tests, where I exclude all countries with the CAGDP higher than 10 or lower than -10 percent of GDP (see robustness tests). None of the correlations of explanatory variables is significantly higher than 50%. The highest correlation of 54.2% is between the capital openness (KAOPEN) and real per capita income relative to the average real per capita income of the high-income OECD countries (RELYOECD).

### 5.1 Estimation Results

Estimation results are reported in Tables 6, 7 and 8. As Ito and Chinn (2007) documented different determinants of the CA for developed and developing

<sup>16</sup> SPREAD sample: ARG, AUS, CAN, DEN, ITA, NOR, RUS, SPA, SWE, USA.

<sup>17</sup> Ferguson and Schularick (2006) provide some evidence for the former, whereas Flandreau and Zumer (2004) provide the evidence for the latter.

countries, I re-run the regression also for various country groups (developed/developing/developing excluding Africa).

Table 6: Current Account Regressions, 1970-2007

| FD proxy       | M3GDP                    | SIZE                     | PBBM                      |
|----------------|--------------------------|--------------------------|---------------------------|
| Model          | FE twoways               | FE twoways               | FE twoways                |
| C              | 3.564<br>(6.808, 0.601)  | 15.603<br>(7.146, 0.031) | 10.436<br>(10.118, 0.306) |
| RELYOECD       | 0.039<br>(0.043, 0.366)  | -0.051<br>(0.050, 0.312) | -0.144<br>(0.046, 0.003)  |
| POLITY2        | -0.217<br>(0.172, 0.209) | -0.185<br>(0.203, 0.364) | 0.502<br>(0.214, 0.022)   |
| FD             | -0.001<br>(0.032, 0.967) | -0.064<br>(0.030, 0.035) | 0.169<br>(0.063, 0.009)   |
| KAOPEN         | 1.451<br>(0.794, 0.069)  | -0.449<br>(0.898, 0.618) | 0.292<br>(0.833, 0.727)   |
| GOVBAL         | 0.341<br>(0.110, 0.002)  | 0.359<br>(0.194, 0.067)  | 0.647<br>(0.364, 0.080)   |
| NFAIN          | 0.001<br>(0.002, 0.544)  | 0.038<br>(0.031, 0.224)  | -0.002<br>(0.021, 0.904)  |
| DEPR           | -0.040<br>(0.074, 0.590) | -0.172<br>(0.085, 0.046) | -0.195<br>(0.148, 0.190)  |
| POLITY2*FD     | 0.000<br>(0.003, 0.938)  | 0.003<br>(0.002, 0.216)  | -0.017<br>(0.008, 0.035)  |
| POLITY2*KAOPEN | -0.055<br>(0.081, 0.499) | -0.021<br>(0.083, 0.805) | -0.044<br>(0.122, 0.721)  |
| KAOPEN*FD      | -0.026<br>(0.008, 0.002) | 0.004<br>(0.007, 0.558)  | -0.015<br>(0.024, 0.532)  |
| TRADEGDP       | -0.014<br>(0.032, 0.668) | 0.060<br>(0.036, 0.096)  | 0.082<br>(0.042, 0.056)   |
| ECONGROWTH     | -0.201<br>(0.131, 0.128) | -0.364<br>(0.260, 0.165) | -0.244<br>(0.280, 0.386)  |
| PBBM*GOVBAL    |                          |                          | -0.008<br>(0.004, 0.084)  |
| Adj. R-squared | 0.606                    | 0.710                    | 0.758                     |
| Countries      | 107                      | 68                       | 43                        |
| Observations   | 409                      | 199                      | 136                       |
| Time span      | 1970-2007                | 1980-2007                | 1990-2007                 |

First, contrary to the stages of economic development hypothesis, there is a negative relationship between the relative income per capita and the current account: a 1-percentage point increase in per capita relative to the OECD average leads to 0.144 percentage point decrease in the current account balance. This effect is driven by the significant positive effect of RELYOECD on investment (0.071 to 0.072). The sign of the economic growth coefficient is negative as expected but insignificant. Looking at the savings and investment regressions sheds more light on the effect of economic growth on the current account. Faster economic growth increases both the savings and investment but

the effect is stronger and more significant in case of investment. These results suggest that both the richer and the faster growing economies tend to run current account deficits.

Table 7: Savings Regressions, 1970-2007.

| FD proxy       | M3GDP                    | SIZE                     | PBBM                      |
|----------------|--------------------------|--------------------------|---------------------------|
| Model          | FE country               | FE country               | FE country                |
| C              | 17.232<br>(7.995, 0.032) | 35.126<br>(9.147, 0.000) | 32.143<br>(16.084, 0.049) |
| RELYOECD       | 0.074<br>(0.042, 0.081)  | 0.027<br>(0.049, 0.581)  | -0.045<br>(0.037, 0.231)  |
| POLITY2        | 0.118<br>(0.190, 0.534)  | -0.369<br>(0.265, 0.167) | 0.619<br>(0.329, 0.064)   |
| FD             | 0.099<br>(0.038, 0.011)  | -0.056<br>(0.036, 0.129) | 0.138<br>(0.074, 0.065)   |
| KAOPEN         | 1.734<br>(1.087, 0.112)  | -1.032<br>(1.298, 0.428) | 1.949<br>(1.680, 0.250)   |
| GOVBAL         | 0.496<br>(0.151, 0.001)  | 0.503<br>(0.315, 0.114)  | 0.671<br>(0.276, 0.017)   |
| NFAIN          | 0.019<br>(0.015, 0.188)  | 0.022<br>(0.023, 0.335)  | 0.017<br>(0.024, 0.482)   |
| DEPR           | -0.041<br>(0.078, 0.602) | -0.185<br>(0.100, 0.068) | -0.194<br>(0.239, 0.421)  |
| POLITY2*FD     | -0.002<br>(0.004, 0.604) | 0.005<br>(0.003, 0.058)  | -0.019<br>(0.010, 0.065)  |
| POLITY2*KAOPEN | 0.110<br>(0.103, 0.291)  | 0.035<br>(0.130, 0.792)  | -0.190<br>(0.150, 0.210)  |
| KAOPEN*FD      | -0.057<br>(0.017, 0.001) | -0.001<br>(0.010, 0.888) | -0.012<br>(0.037, 0.735)  |
| TRADEGDP       | -0.004<br>(0.038, 0.919) | 0.019<br>(0.052, 0.721)  | -0.015<br>(0.044, 0.743)  |
| ECONGROWTH     | 0.262<br>(0.111, 0.019)  | 0.378<br>(0.340, 0.269)  | 0.490<br>(0.304, 0.111)   |
| PBBM*GOVBAL    |                          |                          | -0.008<br>(0.005, 0.114)  |
| Adj. R-squared | 0.784                    | 0.786                    | 0.875                     |
| Countries      | 95                       | 63                       | 41                        |
| Observations   | 358                      | 176                      | 127                       |
| Time span      | 1970-2007                | 1980-2007                | 1990-2007                 |

Second, there is a positive relationship between the government budget balance and the current account. A 1 percentage point increase in the budget balance leads to a 0.341 to 0.647 percentage point increase in the current account. However, this positive effect of the budget balance is mitigated by its interaction with the public bond market capitalization. These results give support to the twin deficits hypothesis. The effect of an increase in the government budget balance on savings is also positive: a 1 percentage point increase leads to 0.496 to 0.671 percentage point increase in savings rate. This suggests that the gov-

ernment budget balance has a non-Ricardian effect on the savings rate, where the Ricardian offset in savings is 0.329 to 0.504 percentage point.

Table 8: Investment Regressions, 1970-2007

| FD proxy       | M3GDP                    | SIZE                     | PBBM                     |
|----------------|--------------------------|--------------------------|--------------------------|
| Model          | FE twoways               | FE twoways               | FE country               |
| C              | 14.069<br>(5.898, 0.018) | 12.588<br>(4.345, 0.005) | 29.125<br>(8.240, 0.001) |
| RELYOECD       | 0.071<br>(0.026, 0.007)  | 0.072<br>(0.036, 0.050)  | 0.035<br>(0.035, 0.310)  |
| POLITY2        | 0.365<br>(0.161, 0.024)  | -0.117<br>(0.128, 0.363) | 0.014<br>(0.187, 0.939)  |
| FD             | 0.061<br>(0.031, 0.050)  | 0.040<br>(0.023, 0.083)  | -0.023<br>(0.064, 0.718) |
| KAOPEN         | -0.005<br>(0.604, 0.993) | 0.060<br>(0.649, 0.927)  | 1.490<br>(0.749, 0.050)  |
| GOVBAL         | -0.053<br>(0.088, 0.546) | -0.096<br>(0.112, 0.396) | 0.251<br>(0.324, 0.441)  |
| NFAIN          | 0.003<br>(0.002, 0.175)  | 0.018<br>(0.011, 0.088)  | 0.009<br>(0.013, 0.521)  |
| DEPR           | -0.051<br>(0.063, 0.414) | 0.005<br>(0.056, 0.925)  | -0.113<br>(0.123, 0.363) |
| POLITY2*FD     | -0.006<br>(0.003, 0.064) | 0.001<br>(0.002, 0.715)  | -0.003<br>(0.009, 0.772) |
| POLITY2*KAOPEN | 0.066<br>(0.045, 0.143)  | 0.060<br>(0.055, 0.272)  | -0.142<br>(0.092, 0.126) |
| KAOPEN*FD      | -0.007<br>(0.009, 0.450) | -0.009<br>(0.006, 0.116) | -0.006<br>(0.019, 0.749) |
| TRADEGDP       | 0.073<br>(0.027, 0.007)  | 0.011<br>(0.046, 0.813)  | -0.037<br>(0.037, 0.327) |
| ECONGROWTH     | 0.463<br>(0.125, 0.000)  | 0.804<br>(0.238, 0.001)  | 0.631<br>(0.269, 0.021)  |
| PBBM*GOVBAL    |                          |                          | -0.003<br>(0.005, 0.516) |
| Adj. R-squared | 0.708                    | 0.809                    | 0.848                    |
| Countries      | 107                      | 68                       | 43                       |
| Observations   | 452                      | 201                      | 138                      |
| Time span      | 1970-2007                | 1975-2007                | 1990-2007                |

These results are in line with Chinn and Ito (2007a), where a one percentage point increase in the budget balance increases the CA balance by 0.1-0.49 percentage point for industrialized countries for the period of 1971 through 2004; and Ito (2009), where a one percentage point increase in the budget balance raises the current account balance by 0.10-0.49 percentage point for industrialized countries. The role of fiscal balance was documented also for oil-exporting countries (Morsy 2009) and for Middle East and North Africa countries Aristovnik (2007) at higher frequencies. On the other hand, the results stand in contrast to Ito and Chinn (2007), where the budget variable is not

statistically significant. As this paper estimates the same model, it is of interest to discuss possible explanations. First, the sample size, its composition and the time span might play the role. Whereas the analysis of Ito and Chinn (2007) encompasses the sample of 19 industrialized and 70 developing countries for the period of 1986 through 2005, this paper encompasses the sample of 21 developed and 86 developing countries for the period of 1970 through 2007. The longer time span enables to include more post-communist or emerging economies in the sample. Furthermore, the longer time span enables to better capture the global imbalances phenomenon related to the past decade. Finally, the difference might stem from the data specification. Whereas Ito and Chinn (2007) converted all variables into deviations from their GDP-weighted world mean, this analysis uses unconverted data.

Third, there is a negative relationship between the dependency rate and the current account balance as expected. A 1 percentage point increase in the dependency rate leads to a 0.172 percentage point decrease in the current account. This effect is significant only when SIZE is used as a proxy of the financial development.

Fourth, the effect of initial levels of net foreign assets on the current account balance is insignificant. However, it has a significant positive effect on investment: a 1 percentage point increase in the NFA leads to a 0.018 percentage point increase in investment.

TRADEGDP, a variable emphasized by the policy-makers has a positive effect on the CA balance. The higher the participation in the international trade, the higher the CA balance.

The effect of the terms of trade volatility (TOTSD) was tested separately because the data availability draws the sample size down to the maximum of 79 (not reported here). The effect is insignificant.

Finally, the estimation results give some support also to the savings glut hypothesis. Size of the financial market has a significant negative effect on the current account balance: a 1 point increase in SIZE decreases the CA balance by 0.064 percentage point.<sup>18</sup> Two proxies of financial development (M3GDP and PBBM) have a significant interaction term; the former with the capital openness, the latter with the institutional quality and the government budget balance. M3GDP is used as a proxy of the financial deepening. Its effect on the CA balance is positive, albeit insignificant, for countries with low level of institutional quality and low capital openness such as China. On the other hand,

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<sup>18</sup> As SIZE is measured as the sum of the stock market capitalization (STOCK) and (CREDIT), it is of interest to examine the separate effect of these two variables to see, which of the components of SIZE is driving the results for the regression with SIZE (available upon request). Both variables have a negative effect on the CA balance but whereas the effect of STOCK is insignificant, the effect of CREDIT is significant: a 1-percentage point increase in CREDIT decreases the CA balance by 0.074 percentage points.

an increase in M3GDP has a negative effect on the CA balance in countries with the high levels of both the capital openness and institutional quality. Here, the effect is significant. Similarly, an increase in the capital openness reduces the CA balance for countries with high levels of financial development (measured as M3GDP) and average to high levels of institutional quality.

The further proxy of interest is the size of the public bond market (PBBM), as the ability to generate safe financial instruments has been emphasized as the main reason of the U.S. current account deficit.<sup>19</sup> The effect of PBBM on the CA balance is positive but this effect is mitigated by its interaction with the institutional quality and the government budget balance. At low 10 percentile values of KAOPEN, POLITY and GOVBAL, a 1-percentage increase in PBBM decreases the CA balance by 0.287 percentage points. On the other hand, the effect of PBBM at high 10 percentile values is positive, albeit insignificant. In countries with high institutional quality, high level of capital openness and high budget deficits (such as USA), PBBM has a negative effect on the CA balance. However, this effect is insignificant. The effect of POLITY yields more interesting results. In countries with high level of capital openness and large public bond markets, a 1 percentage point increase in POLITY2 decreases the CA balance by 0.793 percentage points.

Which of the models is the best? If looking at the adjusted R-squared, the model with PBBM as the proxy of the financial outperforms others, as it explains 75.8 percent of the variance in the CAGDP. Model with proxy of the overall size of the financial sector follows. When comparing models, it is also of interest to look at the current accounts predicted by each model. The implied current accounts with two standard error bands, which provide an approximate 95% forecast intervals suggest that SIZE model predicts the behavior of the U.S. and Japanese CA balance the best, although it underestimates German CA balance for the period of 2005-07.

Here, a note must be made about the multicollinearity problem. The largest VIF in SIZE regression was reported for the interaction term of POLITY2 and SIZE (13.297). The mean VIF was 4.479. As none of the interaction terms was significant, I re-estimated the regression without interaction terms (available upon request). This reduced the mean VIF to 1.765. The largest VIF was reported for relative income (3.188). Dropping interaction terms did not significantly change magnitude or the sign of coefficients with a single exception. The SIZE coefficient was reduced from -0.064 to -0.036 and its significance increased from p-value of 3.47% to 0.62%. Furthermore, the dependency ratio did not retain its significance: the p-value increased from 4.6% to 13.26%.

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<sup>19</sup> Here it must be noted that the U.S. PBBM reaches only average values compared to, for example, Japan, the country with the largest public bond market. To control for the possible outlier effect, I estimated the pooled OLS PBBM model with the dummy for Japan. This dummy was insignificant.

Similarly, dropping the insignificant interaction terms from the current account regression using M3GDP as the proxy of the financial development reduced the largest VIF from 12.036 to 5.282 (interaction term of KAOPEN and M3GDP) and the mean VIF from 3.788 to 2.310. This did not lead to any significant changes in the magnitude, sign or significance of the coefficients. However, it is not possible to see more sensitivity tests because dropping significant interaction terms would lead to the loss of information.

Ito and Chinn (2007) documented different determinants of the CA for developed and developing countries. Therefore, I re-estimate the model for countries grouped by their stage of development (available upon request). This alters the results. In case of the developed countries, the most interesting change is in the effect of the government budget balance. Although it remains positive, it is insignificant. On the other hand, the interaction terms of the financial development with POLITY2 and KAOPEN are significant in all cases, except of model with M3GDP (the p-value of the interaction term of M3GDP and KAOPEN is 18.2%).

Here, however, there are several changes. First, the effect of SIZE conditional on POLITY2 and KAOPEN remains negative. These findings are in line with the global savings glut hypothesis. However, the effect of KAOPEN conditional on SIZE and POLITY2 contradicts the predictions of the global savings glut hypothesis. For developed countries, an increase in the capital openness decreases the CA balance in countries with smallest financial markets and increases the CA balance in countries with the largest financial markets supported by high quality institutions. These findings contradict the global savings glut hypothesis, which assumes that countries with the most developed financial markets and with high levels of capital openness tend to run current account deficits. Indeed, this model overestimates the CA balance of the United States for the period of 2005-07 (not reported here).

PBBM has a significant negative effect on the CA balance for countries with low levels of KAOPEN, POLITY2 and GOVBAL. The effect of KAOPEN conditional on PBBM and POLITY2 is as expected: negative for countries with high levels of POLITY2. However, there is a significant change in the effect of POLITY2, which is positive at all levels of PBBM and KAOPEN. From the policy perspective, such finding is irrelevant for the United States, whose score on the institutional quality is the highest, similarly to most of the developed countries. Therefore, it is not possible to increase the CA balance by improving the institutional quality.

Results are altered also for the models re-estimated for the developing countries (excluding Africa). There is a mixed evidence on the effect of the relative income per capita, which ranges from the positive effect of 0.142 to the negative effect of -0.408. The effect of the GOVBAL is significantly positive: a 1-percentage point increase in GOVBAL increase the CA balance by 0.513 percentage points. These results also suggest that the government balance is more



important in influencing the behavior of the CA balance in developing countries. The twin deficits hypothesis thus fits developing world better than the developed world. The effect of SIZE and PBBM conditional on POLITY2 and KAOPEN is in line with predictions of the global savings glut hypothesis. Thus, the results suggest that an increase in the size of the financial market would reduce the CA surplus in developing countries. This result is in contrast to the findings of Ito and Chinn (2007), where increase in the size of financial markets induces an increase in the CA balance in developing countries. The difference in results may stem from the difference in the sample size and time span (see above). The only result supportive of Ito and Chinn's (2007) conclusion about the positive effect of financial development on the CA balance is the effect of POLITY2 conditional on PBBM and KAOPEN, which suggests that an increase in the institutional quality would increase the CA balance in countries with small public bond markets and low level of capital openness, such as China.

When looking at models estimated for developed and developing countries (excluding Africa), PBBM model has the highest adjusted R-squared (0.871, 0.898 and 0.871 respectively). In case of the United States, PBBM model seems to best capture the CA development (not reported here). PBBM model provides the best prediction of the Chinese, Japanese and German CA as well.

## 5.2 Robustness Tests

To check the sensitivity of results to various proxies of financial development, I re-estimate the panel regression with alternative measures of financial development, such as stock market total value traded (SMTV) as a ratio to GDP and stock market turnover (SMTOT) as a ratio to GDP to control for the financial market activity and the net interest margin (MARGIN) and bank's overhead costs as a share of their total assets (OVERHEAD) to control for the efficiency of the banking market. In the base sample, only one of the financial development proxies was significant: a 1 percentage point decrease in OVERHEAD decreases the CA balance by 1.209 percentage points. This suggests that the better the cost performance of the banking sector, i.e. the lower the bank's overhead costs as a share of its total assets, the lower the CA balance. The relative income had a significant negative effect on the current account balance: a 1 percentage point increase in the relative income leads to a 0.114 to 0.158 percentage point decrease in the current account balance. Finally, the budget balance had a significant positive effect on the current account balance: a 1 percentage point increase in the budget balance increases the current account balance by 0.398 to 0.509 percentage points. None of the interaction terms was significant.

To check if the baseline results are sensitive to outliers, I excluded all observations for which the dependent variable was lower than -10 or greater than

10 (not reported here). This reduced the sample size to the maximum of 69. Some of the coefficients that had been significant before did not retain their statistical significance. This holds especially for the government budget balance, which was significant only in case when PBBM was used as a proxy of the FD. This is probably due to smaller positive effect of GOVBAL on SAVINGS than in the base sample. On the other hand, the coefficients on the financial development, as well as its interactions with KAOPEN and POLITY2 remained virtually unchanged even after excluding the extreme values of CAGDP. Finally, the economic growth is insignificant.

In order to examine the robustness of the results to the choice of data frequency, I reestimated the panel regression using annual data and cross-section averages. Using the annual data, I reestimated the model and also included lagged logarithms of the real effective exchange rate (not reported here). In general, results are similar to those using 5-year averages. More important role is played by the real economic growth and the government budget balance, suggesting the importance of income shocks. Net foreign assets have a significant positive effect on the CA balance in the short-run. The effect of the financial development remains unchanged when proxied as M3GDP, SIZE and PBBM. Once again, PBBM model has the highest adjusted R-squared (0.76) and predicts that an increase in the capital openness decreases the CA balance in countries with largest public bond markets supported by high-quality institutions.

Cross-section regressions (not reported here) suggest that in the long-run, the behavior of the CA balance is determined by different factors. The fiscal balance has a significant positive effect on the CA balance, however, this effect is mitigated by its interaction with PBBM. The effect of the financial development on the CA balance is positive in the long-run but this effect is mitigated by the interaction with POLITY2. The single exception is PBBM model, where the negative effect of PBBM is further magnified by its interaction with the fiscal balance. Nevertheless, the model suggests that countries with high-quality institutions and developed financial markets tend to run CA deficit (or smaller CA surplus). In contrast to the short- and medium-run models, the between model supports the stages of development hypothesis that poorer and faster growing economies tend to borrow against their future income and run the CA deficit. Finally, the model suggests that being an oil exporter increases the CA balance by 3.068 to 6.933 percentage points. On the other hand, the USA dummy is significant in 4 out of 8 models and suggests a decrease in the CA balance by 4.878 to 6.168 percentage points. These results suggest that there is some unexplained factor unique to the United States. Originally, the USA dummy was included in the model to control for the significantly larger size of the U.S. financial market relative to the rest of the world. However, this unexplained factor might capture broader phenomena, such as the specific

position of the United States in the world economy or the perceived “safe haven” position of U.S. financial instruments.

Ito and Chinn (2007) document that their estimation results are sensitive to the inclusion or exclusion of African countries. Therefore, I re-estimated the model (not reported here). Exclusion of African countries did not significantly alter the results. The major change is in the significance of the interaction term of SIZE and POLITY2, which makes the results more similar to those of developed countries. Second, I re-estimated the model without oil-exporting countries. This did not significantly alter the results.

Finally, I re-estimated the regression using XCONST (constraint on the executive) as a proxy of the institutional quality (not reported here). This variable is used as a proxy of the risk of expropriation. Similarly to the period of 1865 to 1913, the effect of XCONST and its interactions is insignificant, except of PBBM regression, where the results are similar to the base regression using PBBM as the proxy of the financial development and POLITY2 as the proxy of the institutional quality.

## 6. Conclusions and Policy Recommendations

This paper empirically tested the medium-term determinants of the current account in two eras of globalization. The main aim was to examine whether the redistribution of excess savings was driven by the same factors. The comparison has yielded several similarities. Thus, although the excess savings were produced by the developed part of the world during the first era of globalization and has been produced (mostly) by the developing part of the world in the past decade, this excess savings were redistributed along similar lines to relatively rich countries with developed financial markets, high quality institutions and high proportion of dependent persons. An important role was played by the government budget balance, albeit only in the short-run between 1865 and 1913. However, there were also several differences, especially in the effect of the economic growth.

In general, the effect of the relative income per capita was negative for both periods. A 1 percentage point increase in the relative income per capita decreased the CA balance by 0.115 to 0.128 percentage points in the pre-War period and by 0.144 percentage points in the post-BW period. These results support the Lassudrie-Duchêne *et al.* (1990) version of the stages of development hypothesis. On the other hand, the effect of the economic growth was different during two examined periods. Whereas in the pre-War period faster-growing economies tended to run the CA surplus, the opposite was true for the post-BW period.

Dependency rates played some role in both periods, suggesting the importance of the “intergenerational transfer” (Taylor and Williamson 1994). Thus, whereas in the pre-War period the excess savings were transferred from old

savers in the Old World to young savers in the New World, in the past decade, the excess savings were transferred from old savers in China and other East Asian countries to young savers in various parts of the world.

In the pre-War period, the government budget balance is insignificant in the medium-run. However, its effect in the short-run is positive, as predicted by the twin deficits hypothesis. This suggests the importance of the short-run shocks to income (Veselkova 2010). In the post-BW period, the government budget balance has a positive effect on the CA balance but this effect holds only for developing countries.

Finally, this analysis focused also on the effect of the financial development and its interaction with the institutional quality and capital openness. In the pre-War period, a 1 point increase in the institutional quality reduced the CA balance by 0.384 percentage points. The results suggested that the financial development played an important role as well: an increase in the financial deepening reduced the current account balance. The two variables had a joint effect on the investment rates. In countries with low-quality institutions, further financial deepening led to an increase in investment rates. The opposite was true for countries with high-quality institutions. Similarly, improvement in the quality of institutions led to an increase in the investment rates in less financially developed economies and to a decrease in more financially developed countries.

Here, it must be noted that the comparison is complicated by the data availability for the pre-War period. There, financial deepening was measured as monetary aggregate M2 as a percentage of GDP. For the post-Bretton-Woods period, the financial deepening was measured as monetary aggregate M3 as a percentage of GDP. However, other proxies of the financial development, such as the size of the financial market, size of the public bond market or the efficiency of the banking sector yielded more interesting results. As both the Great Britain in the pre-War period and the United States in the post-BW period reached only average levels of financial development if measured as monetary aggregate M2 or M3, it is reasonable to assume that the effect of the financial development on the CA balance in the pre-War period would be different if measured as the stock or the bond market development. Some insights are provided by the analysis of the post-BW period.

Size of the financial market, measured as the sum of the stock market capitalization and the private credit creation, has a significant negative effect on the CA balance. These results hold, whether looking at all countries or developed and developing countries separately. Thus, the results support the common view that the United States attracts capital from the rest of the world because its financial market is the deepest and the most liquid. Similar results were obtained when examining the efficiency of the banking sector.

The effect of the capital openness provides mixed evidence to the global savings glut hypothesis. An increase in the capital openness increases the current account in developed countries with the largest financial markets and the

high-quality institutions. This is in contrast to the claims that more financially developed countries with high level of capital openness absorb the capital from abroad and therefore tend to run the current account deficit. In developing countries, the effect of the capital openness is insignificant. These results do not give much support to the claim that the capital account liberalization in developing countries might reduce their CA surpluses.

Based on the above, it is possible to make three conclusions. First, the current account balances were determined by similar factors in both eras of the globalization. Second, the global savings glut and twin deficits hypothesis are not mutually exclusive (see also Ito and Chinn 2007). In the medium-run, however, the twin deficits hypothesis seems to hold only for developing countries. On the other hand, the effect of the financial development is universal for both developed and developing countries, whether measured as the overall size or efficiency of the financial market. These results support the view that countries with more developed financial markets tend to be capital importers. However, the effect of capital openness is in contrast to the predictions of the global savings glut hypothesis. In developing countries, the capital openness does not seem to play any role in determining the current account balance in the medium-run, whereas in developed countries its effect is positive for countries with large financial markets and high degree of capital openness. These results bring us to the third conclusion, the policy recommendations. Based on the above it is possible to argue against the oft-claimed argument that capital account liberalization in East Asia would reduce the large current surpluses in the region. Rather, these countries should opt for policies that would enhance their financial development. In case of China, these policies might include the privatization through the stock market or further banking sector reforms. Loosening of fiscal policy would have the similar effect in both the short- and the medium-run. Changes in the one-child policy might reduce the current account surplus as well. Finally, the long-run regressions suggest that there is some unexplained factor related to the United States. This factor may either be related to the size of the U.S. financial market relative to other countries or to the broad phenomenon related to the specific position of the United States or its currency in the international economy.

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